

Hospital Infection Control Practices among Nursing Staff Working at Tertiary Care Hospital of Khairpur, Sindh

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ABSTRACT

OBJECTIVES: The objective of this study was to assess the Knowledge and Practices regarding infection control among nursing staff working at Civil hospital Khairpur, Sindh.

BACKGROUND: Hospital acquired infections are the major concerns across the world. However, nurses are at high risk due to front line healthcare providers that increases occupational health hazards of infectious disease. Nurses can prevent themselves by adopting positive infection control practices at their routine work.

METHODS: All the staff nurses working in the civil hospital Khairpur were included in this cross sectional study. Both quantitative and qualitative methods was used to identify the practices of nurses and their perception regarding infection control through validated, pretested, piloted questionnaire after taking the written consent. Data analyzed by frequency and percentage calculated for categorical variable like gender, education level, perception, and practices and Chi-square test applied for studying the association.

RESULTS: The study includes hundred eleven nurses in this study among them 71(64.0%) were female nurses and 40, (36%) were male nurses. There was significant difference between both genders regarding their understanding that special precautions are required for Hepatitis B, C & HIV patients like; double gloves, mask special gowns, disposable, or double sterilization of instruments ($p < 0.05$), perception regarding HIV patient treatment and care in the isolation ward has significant difference in both gender ($p < 0.05$). Knowledge and perception regarding special processing of HIV, HCV, HBV cases instruments also shown a significant difference ($p < 0.05$).

CONCLUSION: Study concluded that the overall infection control practices were very poor among the nursing staff. There is a need for standard inspection and training programs to ensure these infection control practices should be in place proper way. Provision of the Personal protective equipments should be basic component of the protective approach.

KEYWORDS: Infection Control Practice, Nursing Staff, Personal Protection Equipment

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INTRODUCTION

Infection control (IC) is one of the major task performed by the Nurses for keeping the hospitals clean¹. Nurses are front line healthcare provider since high risk nursing healthcare practice that increases the opportunity for nurses and patient's exposure to potential material include blood and body fluid, mucus membrane/ non-intact skin and parental exposure from injuries with contaminated sharps, musculoskeletal injuries repetitively experience of nursing personal^{2,3}.

The nature of hospital setting make them likely environment for spread of infection because nurses have to deal with different type of patient those suffering from communicable as well as non communicable diseases and hospital acquired infections⁴. Transfer of contagious agent from patient

to nursing care provider or vice versa in clinical environment define as cross infection. There are three modes of transmission of disease including "direct contact with blood, mouth secretions, or other secretions. Indirect contacts, contact with contaminated bed sheet, cloths, syringe, instrument, operatory equipment or environmental surfaces, contaminated objects and airborne droplets⁵. Health assessment is core component of nursing practice that provide awareness of patient history, health status of patient and its help to determine priorities in patient cares and ensure safe patient care delivery that are helpful nurse for clinical decision making prevent infectious disease to nurses and patients⁶. During the nursing care procedures occupational health hazards of infectious disease may cause life threatening disease due to permanent contact with infectious agent⁷.

Study shows that the nurses are at risk for occupationally acquired blood borne virus infection due of poor compliance with standard infection control practices resulting⁸. Infectious diseases; influenza, rubella⁹, mycobacterium tuberculosis, nosocomial blood-borne Pathogens (HBV,HCV,HIV), as per gillus species, staphylococci, streptococci, mumps, could effect health the health of nurses in hospital. However, by adopting principles infection control practices and disease control measures, nurses could save themselves from these cross infections¹⁰.

Healthcare associated hospital acquired infection are more common and poor event in health care system Worldwide millions of patients are affected annually and that increases patients' morbidity, disability and mortality and also increases healthcare costs. Due to non-adherence of healthcare workers' to infection control practices. The rate of HAIs is high globally especially in developing countries including Pakistan¹¹. Infection control practices of nursing staff are the activities that protect them and client from Hospital acquired infections include hand washing, personal protection, sterilization, disinfection, clean environment, safe injection and care practices. Therefore Standard precautions must be applied by nurse to all patients throughout the entire encounter, whether or not the patient has known or suspected infectious process¹².

The current study has been conducted to assess the Knowledge and Practices regarding infection control among nursing staff working at Civil hospital at Khairpur Sindh.

METHODOLOGY

Type of this study is cross sectional conducted in civil hospital Khairpur that is affiliated with Khairpur Medical College at Khairpur. Study was conduct in period of 6 month starting from July to December 2016. Universal sampling technique was adopted by including all nursing staff and students nurses working in this tertiary care hospital in different Units of Surgical, Medical, Intensive Care Unit, Operation Theater, Pediatric, Obstetric/Gynecology, Emergency ward, NICU, Orthopedic and Other Units where they were directly contact with the patient admitted or coming in the hospital for treatment during the study period were included in the study. First year nursing student, doctors, paramedical staff, laboratory technicians, dispensers, pharmacists excluded. Data was collect through World Health Organization (WHO) pretest and validated self-administrated questionnaire and observation checklist¹³. Questionnaire was given to the respondent and collected on the same day during duty hours. Observations during different duty timings conducted with patient during checking of vital

sign, preparation of beds for patient, nursing procedure, medication at the different timings, hand washing. To check the questionnaire validity the researcher adjusted the original questionnaire based on the feedback and the literature review. Study approval obtained from HSA review committee and permission taken from the medical superintendent, nursing superintendent and concerned nurses for conducting the study.

RESULTS

When the level of education was Stratified with respect to the gender, it was observed that there was significant difference ($p= 0.007$ less than 0.05). Females were more qualified than males in our study. Socio-demographic characteristics can be shown in Table I.

Table II shows the perception of respondent regarding spread of infection. On the vaccination of healthcare workers, most of nurses 88.3% strongly agreed that healthcare workers should be vaccinated again Polio, measles, mumps, influenza, tetanus, and hepatitis B. 72.1% strongly agreed and 18% agreed that PPE such a respiratory mask, eye protection shield used in practice could prevent droplet infections. 84.7% nurses majority strongly agreed that before the care and treatment of the every patient history and disease of every patient should checked to protect themselves and other patient from infections. 64.9% strongly agreed that needle should not recap to avoid possible exposure to needle stick injuries. Results of the study also focused on the possible barrier, which could be noticeable regarding poor compliance with standard precautions. Most of nurses perceived that large numbers of patient was the main causative factor for poor compliance of standard precautions. Most of nurses perceived that standard precautions were important for practice. Majority of nurses wash their hands with soap. Nurses mostly applied bar soaps, which shared by others .The study result has indicated that routine of hand washing of most of nurses, were after touching contaminated objectives. Most of nurses do not wash their hand before contact with patient. After contact / removing gloves, most of nurses not wash their hands. Large number of nurses did not wash hands before performing an aseptic task e.g., insertion of IV or preparing an injection). It was observed that not all nurses' followed Six-step technique for hand washing WHO recommend which. When the Gender stratified with respect to the soap applied during hand washing. There was significant difference ($p= 0.000$)females were applying soap more than males and the level of education was stratified with the respect of qualification there was significant difference applying soap, student nurses

less compliance with soap Applying than staff nurses (diploma in nursing + BScN) ($p=0.000$)

On stratification with respect to education and practice regarding aseptic technique use before intravenous cannulation association was found that Nurses who were more educated applied aseptic technique for IV cannulation rather than nursing student or having only diploma in nursing. ($p=0.000 < 0.05$).

TABLE I: GENERAL CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristics	Frequency	Percentage
Gender		
Male	40	36%
Female	71	64%
Age Group		
<19	15	13.5%
20-30	61	55.0%
31-40	29	26.1%
41-50	5	4.5%
>5	1	0.9%
Education Level		
Diploma student	61.0	55.0%
Diploma in nursing	30.0	27.0%
Diploma + BScN	6	5.4%
Diploma student + Other	2	1.8%
Diploma in nursing + Other	10	9.0%
diploma in nursing BScN + Other	2	1.8%
Student Nurses		
2nd year	36	32.4%
3rd year	17	15.3%
4th year	10	9.0%

TABLE II: PATTERN OF THE PERCEPTION REGARDING INFECTION CONTROL AMONG NURSES AND PARAMETERS OF HAND WASHING

Perception pattern	Strongly agreed	Agreed	Mild agreed	Disagreed	Strongly disagreed
PPE as barrier of infection	89(80.2%)	15(13.5%)	4(3.6%)	1(.9%)	2(1.8%)
Use of PPE for nurses and patient safety	84(75.7%)	21(18.9%)	4(3.6%)	2(1.8%)	0(0%)
Spread of infection by nurses in hospitals	89(80.2%)	12(10.8%)	2(1.8%)	5(4.5%)	3(2.7%)
Special precaution for HBV,HCV,HIV patient	88(79.3%)	15(13.5%)	2(1.8%)	1(0.9%)	5(4.5%)
Special processing of HIV cases instruments	80(72.1%)	14(12.6%)	5(4.5%)	5(4.5%)	7(6.3%)
HIV patient treat in isolation Ward	79(71.2%)	20(18%)	0(0%)	4(3.6%)	8(7.2%)
Vaccination of healthcare workers	98(88.3%)	10(9%)	2(1.8%)	0(0%)	1(0.9%)
PPE barriers against droplet infections	80(72.1%)	20(18%)	3(2.7%)	6(5.4%)	2(1.8%)
No need of vaccination using PPE	21(18.1%)	14(12.6%)	5(4.5%)	26(23.4%)	45(40.5%)
Medical History before treatment	94(84.7%)	11(9.9%)	5(4.5%)	1(0.9%)	0(0%)
Used needles should not be recapped	72(64.9%)	8(7.2%)	6(5.4%)	8(7.2%)	17(15.3%)
Resource barrier of precaution	85(76.6%)	20(18%)	4(3.6%)	0(0%)	2(1.8%)
Large numbers of patients barriers of precautions	85(76.6%)	14(12.6%)	4(3.6%)	2(1.8%)	6(5.4%)
Stander precaution are not important in infection control practice	12(10.8%)	6(5.4%)	2(1.8%)	23(20.7%)	68(61.3%)

Direct observation

It was observed that infection control committee (ICC) did not exist in the hospital. Nursing staff of the hospital were not switching over to updated education of infection control. Infection control practitioner Nurse / Doctor post was not available. Policy of needle stick management, procedure, and reporting were nonexistent. All items needed for isolation precautions as surgical masks, thick utility gloves, non - sterile gloves, protective caps and fluid resistant gowns was in limited supply. Emollient and PPE were sometimes not accessible to students nurses to use after hand washing. Waste management was poor. Laundry staff did not use proper PPE; hospital linens storage areas were poorly arrange, and maintain. All wards / units sterilization of equipment was poor and it was observed that equipment used during procedures was without sterilization as shown figure- 2. After use, surgical instruments were poorly clean and poorly hygiene was maintained.

FIGURE I: SURGICAL INSTRUMENTS POOR STERILIZATION



DISCUSSION

Nurses are not only on the risk of blood borne pathogens but also come in the contact with patient and patient visitors who may have rubella, chickenpox, SARS, Pertussis, mumps, Influenza, tuberculosis transmissible disease¹⁴. Environment is growing concern of all health care facilities. Environmental health embrace the quality of life. That is determined by physical, chemical, biological, social and psychological problems in the environment¹⁵. Therefore Nurses and every global citizens responsibility is to recognize and address environmental hazards that might affect patients, nurses themselves and the community at large¹⁶. Nurses work together with other professionals and community encouraging local, State; countrywide and global efforts to assemble health need though keeping out of harm's way and healthy environment¹⁷. Use of standard precautions is primary strategy for Nosocomial infection control in the hospitals¹⁸. Most of previous studies conducted and have divulged that 35.9% of nurses do not use gloves when dealing with body fluids¹⁹. Our study result for not compliance with use of gloves is 33.3% and are at a risk of body fluid contamination.

Hand hygiene is also best prevention from Hospital acquired infections through this burden of HAIs could reduced²⁰. Previous studies reported that Nurses wash their hand before any procedure and contact with patient. An study result shows the compliance with hand washing in clinical practice is 0%²¹. Our study results are also similar that nurses compliance with hand washing before performing an aseptic task were 0.9% and an other study 10.7% reported wash their hand after removal of gloves²². Near to our study findings, 19.8% wash their hands after contact to the patient or removal of gloves. A Kuwait study self reported compliance that nurses' compliance with hand hygiene higher after patient care rather than before care or procedure²³. Our study findings are also the same that nurses compliance with hand hygiene is higher after patient care relatively than before care procedure.

A principle regarding recapping of needle acknowledged that recapping a needle is forbidden in sort to trim down risk of transmission of blood borne pathogens²⁴. In our study it is shocked sign that 66.7% nurses not band and recap disposable syringe after use this finding was similar with another study²⁵. Study shows that 70% participants recapped syringes after using the syringes²⁶. Study participant recapped needle 75.5%. This practice put nurses in to the risk of needle stick injuries. Perceptions' contradictory to the practice of nurses. In our study 64.9% participants strongly agreed that used syringe should not be

recapped similar finding in the other study, participant said 63% that used syringe should be bent after use²⁷. On the literature review it is concluded that health-care workers compliance with standard precautions below the recommended level in all studies health workers blamed lack of material resources²⁸. Similarly, in our study, most of participants perceived that lack of resources hinder between the compliance with infection control practices. About availability of sharp disposal system a study reported that was 3.3%²². Our study result facility observation safety box was missing in the wards.

The available data demonstrates that nursing staff use PPE more frequently including gloves and less used mask. Small percentage of nursing staff uses every time PPE where exposure is possible²⁹. Nurse's poor compliance with the guideline of infection control recommendation observed and reported in many different studies^{1, 21, 30, 31}. Our study also identified that gender of the nurses is significantly different in practice regarding infection control practice, female nurses compliance is more with Hand hygiene, PPE, practice, banding of needle before disposable, more than males and also significant difference in the education, female are more educated than males in our study.

CONCLUSION

Study concludes that poor practices among nursing professionals are reported. However, good knowledge existed among nursing professionals. Most of nurses reported that PPE are good barriers for themselves and client. Most of nurses were familiar with proper sterilization disinfection mechanism. A good number of nurses reported that the instruments used with HIV, HBV and HCV patients must be sterilize with special care.

LIMITATION

These results cannot be generalized because we had limitation that this study was hospital based and conducted in only one tertiary care hospital of Sindh.

REFERENCES

1. Sarani H, Balouchi A, Masinaeinezhad N, Ebrahimitabas E et al., Knowledge, Attitude and Practice of Nurses about Standard Precautions for Hospital-Acquired Infection in Teaching Hospitals Affiliated to Zabol University of Medical Sciences (2014). *Glob J Health Sci*. 2015; 8(3): 193-8. doi: 10.5539/gjhs.v8n3p193.
2. Stone PW, Clarke SP, Cimiotti J, et al., Nurses' working conditions: implications for infectious disease. *Emerg Infect Dis*. 2004; 10(11): 1984-89. doi: 10.3201/eid1011.040253

3. Collins, AS (2008). Preventing health care-associated infections. In: Hughes RG, editor, Patient Safety and quality: An Evidence Based Handbook for Nurses (2011/02/18 ed. Vol 02). Rockville, MD: Agency for healthcare research and quality (AHRQ). Publication No. 08-0043.
4. Efstathiou G, Papastavrou E, Raftopoulos V, Merkouris A. Factors influencing nurses' compliance with Standard Precautions in order to avoid occupational exposure to microorganisms: A focus group study. *BMC Nursing* 2011; 10(1): p. 1.
5. Shahida SM, Islam A, Dey BR, Islam F, Venkatesh K, Goodman A. Hospital Acquired Infections in Low and Middle Income Countries: Root Cause Analysis and the Development of Infection Control Practices in Bangladesh. *OJOG*. 2016; 6(1): 28-39.
6. Weber JR, Kelley JH. Health assessment in nursing. 5th ed. Philadelphia USA. Walters Kluwer / Lippincott Williams & Wilkins Health. 2013.
7. Fennessey A, Wittmann-Price RA. Physical assessment: A continuing need for clarification. *Nurs Forum* 2011; 46(1):45-50. doi: 10.1111/j.1744-6198.2010.00209.x.
8. Mosendane T, Kew MC, Osih R, Mahomed A. Nurses at risk for occupationally acquired blood-borne virus infection at a South African academic hospital. *SAMJ*. 2012; 102(3): 153-56.
9. Wong, KK, Davey RT, Hewlett AL, et al., Use of post-exposure prophylaxis after occupational exposure to Zaire ebolavirus. *Clin Infect Dis*. 2016; 63(3):376-9. doi: 10.1093/cid/ciw256.
10. Sydnor Emily RM, Perl TM. Hospital epidemiology and infection control in acute-care settings. *Clin Microbiol Rev*. 2011; 24(1):141-73.
11. World Health Organization. Health care-associated infections. Fact Sheet[Internet] Available from: http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf (Accessed Feb 13, 2015), 2016.
12. Estes MEZ, Theobald KA, Estes Z. Health assessment and physical examination. South Melbourne, victoria, Australia. Cengage Learning Australia. 2013.
13. WHO (1999) Pruss A, Gioult E, Rushbrook P. Safe management of wastes from healthcare activities. World Health Organization. Available from: <http://apps.who.int/iris/bitstream/handle/10665/42175/9241545259.pdf;jsessionid=8446AA93EC4E5ECA5DE1391A08EC720C?sequence=1>
14. Kumar R, Somrongthong R, Shaikh BT. Effectiveness of intensive healthcare waste management training model among health professionals at teaching hospitals of Pakistan: a quasi-experimental study. *BMC Health Serv Res*. 2015; 15:81. doi: 10.1186/s12913-015-0758-7.
15. Elison-Bowers P, Otterness N, Pritchard M. Environment, Health, & Nursing Practice. Creative Education. 2011; 2(3): 321-6.
16. Kumar R, Somrongthong R, Ahmed J. Impact of waste management training intervention on knowledge, attitude and practices of teaching hospital workers in Pakistan. *Pak J Med Sci*. 2016; 32(3):705-710. doi: 10.12669/pjms.323.9903.
17. American Nurses Association. ANA's principles of environmental health for nursing practice with implementation strategies. Silver Spring, MD: American Nurses Association; 2007.
18. Kumar R, Khan EA, Ahmed J, Khan Z, Magan M, Nousheen, et al. Healthcare waste management (HCWM) in Pakistan: current situation and training options. *JAMC*. 2010; 22(4):101-6.
19. Gould D, Drey N. Student nurses' experiences of infection prevention and control during clinical placements. *Am J Infect Control* 2013; 41(9): 760-3. doi: 10.1016/j.ajic.2013.01.025.
20. Pincock T, Bernstein P, Warthman S, Holst E. Bundling hand hygiene interventions and measurement to decrease health care-associated infections. *Am J Infect Control* 2012; 40(4 Suppl 1): S18-S27. doi: 10.1016/j.ajic.2012.02.008.
21. Abubakar SM, Haruna H, Teryila KR, hamina D, Ahmadu I, Babaji M, et al. Assessment of knowledge and practice of standard precautions among nurses working at Federal Medical Centre Gombe, Nigeria. *Direct Res J Health Pharmacol* 2015; 3(1):1-11.
22. Amoran O, Onwube O. Infection control and practice of standard precautions among healthcare workers in northern Nigeria. *J Global Infect dis*. 2013; 5(4):156-63. doi: 10.4103/0974-777X.122010.
23. Al-Wazzan B, Salmeen Y, Al-Amiri E, Abul A, Bouhaimed M, Al-Ta'ar A. Hand hygiene practices among nursing staff in public secondary care hospitals in Kuwait: self-report and direct observation. *Med Princ Pract* 2011; 20(4): 326-31. doi: 10.1159/000324545.
24. Juni MH, Aiman MA, Nabilah AA, et al. Perception Regarding Needle Stick and Sharp Injuries among Clinical Year Medical Students. *Int J Publ Health Clin Sci* 2015; 2(1): 69-80.
25. Kulkarni RS, Giri PA, Gangwal PR. Injection Safety: Knowledge and Practices among Nursing Personnel in Tertiary Care Teaching Hospital of Marathwada Region of Maharashtra, India. *Arch Community Med Public Health*. 2016; 2(1):018-21. DOI: 10.17352/2455-5479.000011.

26. Bolarinwa OA, Salaudeen AG, Aderibigbe SA, et al. Injection safety practices among primary health care workers in Ilorin, kwara state of Nigeria. Health Sci J. 2012; 6(3): 496-508
27. Kumar R, Samrongthong R, Shaikh BT. Knowledge, attitude and practices of health staff regarding infectious waste handling of tertiary care health facilities at metropolitan city of Pakistan. JAMC 2013; 25(1-2):109-12.
28. Valim MD, Marziale MH, Richart-Martinez M, Sanjuan-Quiles A. Instruments for evaluating compliance with infection control practices and factors that affect it: an integrative review. J Clin Nurs 2014; 23(11-12): 1502-19. doi: 10.1111/jocn.12316
29. Copanitsanou P, Sourtzi P. Knowledge, Attitudes and Compliance of Nursing Staff with Occupational Risk Prevention Guidelines in the Hospital. A Systematic Review. Nosileftiki 2013; 52(2): 131-46.
30. Cicolini G, Simonetti V, Comparcini D, et al. Nurses' knowledge of evidence-based guidelines on the prevention of peripheral venous catheter-related infections: a multicentre survey. J Clin Nurs. 2014; 23(17-18): 2578-88. doi: 10.1111/jocn.12474.
31. Sheth AM, Jani DS, Rangoonwala MM, Kadri AM. Assessing the awareness and practice of Hospital Acquired Infections (HAIs) among nursing staff of Civil Hospital, Rajkot, Gujarat, India. IJRMS 2015; 3(8): 1844-50.



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